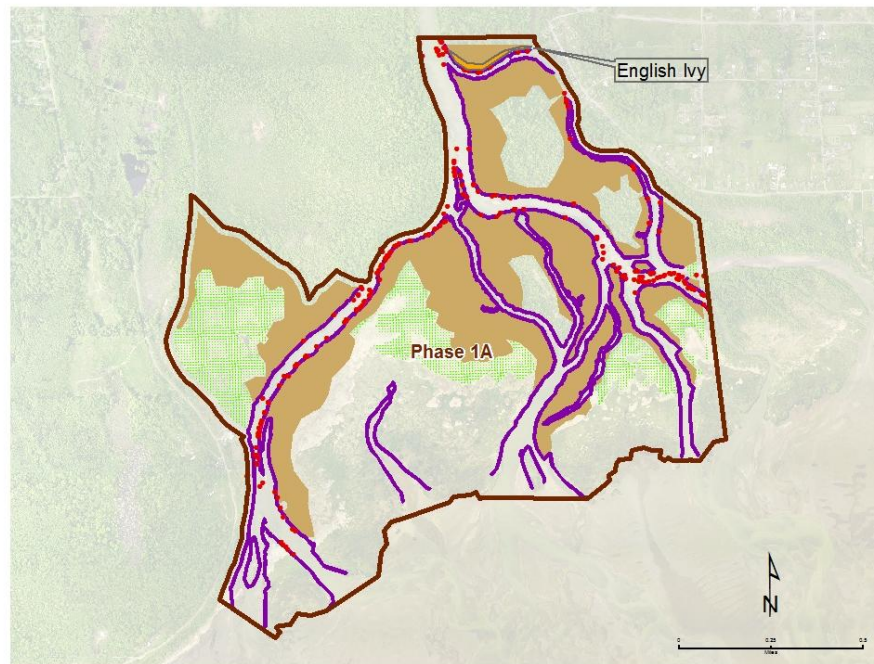


**Lummi Nation Wetland and Habitat Mitigation Bank  
2014 (Year 3) Monitoring Report for 2011 Enhancement Areas  
Phase 1A Nooksack Delta Site**



**Prepared For:**

Interagency Review Team  
Lummi Nation Wetland and Habitat Mitigation Bank

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## **EXECUTIVE SUMMARY**

<b>Summary of Year 3 Monitoring Activities for 2011 Enhancements</b>	
<b>Name of Mitigation Bank</b>	Lummi Nation Wetland and Habitat Mitigation Bank
<b>Bank Phase</b>	Phase 1A
<b>U.S. Army Corps of Engineers Reference Number</b>	NWS-2008-1519-SO
<b>Bank Sponsor</b>	Lummi Natural Resources Department
<b>Project Lead</b>	Jeremy R. Freimund, P.H.; Water Resources Manager; jeremyf@lummi-nsn.gov; 360-312-2314
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<b>Contracted Technical Support</b>	Michael Muscari, PWS; Senior Wetland Ecologist, ESA – Northwest Biological Research Group; 206-789-9658
<b>Monitoring Dates:</b>	September 15, 2014 to October 10, 2014.

## **INTRODUCTION**

The purpose of this Year 3 Monitoring Report is to document the monitoring results for the enhancement activities conducted during 2011 for Phase 1A of the Lummi Nation Wetland and Habitat Mitigation Bank (Bank). Phase 1A is located at the Nooksack Delta Site. A 2011 As-Planted Report, which documents the enhancement activities conducted during 2011, was submitted to the Interagency Review Team (IRT) during March 2013. Monitoring of the 2011 enhancement activities was conducted during the fall of 2012 (Year 1) and 2014 (Year 3). The Year 1 Monitoring Report was submitted to the IRT during July 2013.

This monitoring report is part of the documentation required to demonstrate attainment of the performance standards established in the Mitigation Banking Instrument (MBI). The IRT must review and approve the documentation as a condition of awarding and releasing additional Bank credits. The IRT award of credits will be reflected in a letter issued using IRT letterhead and signed by the IRT Chair (i.e., the U.S. Army Corps of Engineers, District Engineer or his/her designee).

Documentation of the Baseline Vegetation Conditions of the Nooksack Delta Site – Phase 1A was completed in December 2010 and accepted by the IRT. Because of the limited planting window and anticipation that the MBI would be executed during the second quarter of 2011, enhancement activities were initiated during the first quarter of 2011. Although the MBI was not executed until July 6, 2012, the IRT stated that the December 2010 Baseline Vegetation Conditions report would be the basis for evaluating attainment of the performance standards identified in the MBI.

The overall monitoring and reporting schedule for the Bank development period is shown in Table 1. Monitoring and reporting will be conducted for 10 years for each stage of the Bank development, beginning with Year 0 for each treatment area completed. The Year 0 report is in the form of an “As-Planted Report”. Because of the large area where enhancement activities are occurring, it is not possible to treat all areas within a single year. Consequently, treatment is occurring in stages. Treatment in all areas was expected to take 4 years (i.e., 4 stages); therefore, the overall schedule was expected to extend for 14 years. Monitoring reports for the earlier stages of the Phase 1A site development will continue beyond Year 10 until Year 10 is reached for the latest planting stage.

**Table 1. Phase 1A Monitoring and Reporting Schedule**

Action	Year <sup>1</sup>										
	0	1	2	3	4	5	6	7	8	9	10
Monitor Reed Canarygrass and Yellow Flag Iris and Shrub Plantings	x <sup>2</sup>	x		x		x		x			x
English Ivy	x <sup>2</sup>	x		x		x		x			x
Monitor Knotweed	x <sup>2</sup>	x	x	x	x	x	x	x	x	x	x
Monitor Conifer Underplantings	x <sup>2</sup>	x		x		x		x			x
Monitoring Reports	As-planted report <sup>2</sup>	x	x	x	x	x		x			x

<sup>1</sup> Monitoring and reporting will be conducted for 10 years for each stage of the Bank development beginning with Year 0 for each treatment area completed. Treatment in all areas is expected to take at least 4 years; therefore the overall schedule will extend for at least 14 years. As described below, monitoring reports for the earlier stages of the Phase 1A site development will continue beyond Year 10 until Year 10 is reached for the latest planting stage.

<sup>2</sup> Documentation of enhancement actions (“As-Planted Reports”).

## PHASE 1A DESIGN PLAN SUMMARY

The enhancement design for the Phase 1A Nooksack Delta Site is focused on (1) removing and managing invasive plant species; and (2) increasing native plant species richness through planting native shrubs and coniferous trees. Following the weed control effort and plantings, the primary work on the site will involve monitoring and maintenance activities.

The Nooksack Delta Site Phase 1A enhancement design is comprised of the following elements in the general sequence that they will occur:

1. Designate and protect the land within the site through a conservation easement;
2. Eradicate or control invasive species;
3. Plant native conifer species within the deciduous forests; and
4. Monitor effectiveness of treatments and underplantings, and repeat as needed to meet performance standards.

The mitigation bank locations in Phase 1A where enhancement activities occurred during 2011 and that were monitored during 2014 (Year 3) are shown on Figure 1 through

Figure 3. Specific design elements for the enhancement areas are summarized in Table 2 and further described below.

**Table 2. Phase 1A Enhancement Actions Completed in 2011**

Type of Wetland Enhancement Action	Area (acres)
Knotweed removal: treatment and monitoring area	0
Weed removal/willow planting: reed canarygrass, yellow flag iris	29.7
Weed removal: English ivy	2.1
Conifer underplanting	0
<b>Total Enhancement Area for 2011</b>	<b>31.8</b>

## **BANK OBJECTIVES AND PERFORMANCE STANDARDS**

The Bank's success will be measured by documenting progress toward achieving the objectives and associated performance standards identified in the MBI. The prescribed performance standards are intended to measure the success of the ecological restoration and enhancement efforts at the Bank. Only the Phase 1A performance standards related to the work performed in 2011 (Year 0 for this stage) are described below.

**Objective 1:** Permanently protect aquatic ecosystem functions of the Nooksack Delta Site by instituting the MBI and implementing a conservation easement with permanent funding for site stewardship.

**Performance Standard:** The conservation easement and financial assurances are included in the MBI. The IRT approved the MBI on July 6, 2012 and the Conservation Easement was approved by all parties and recorded on October 17, 2012. The IRT released 19 credits on October 18, 2012.

**Objective 2:** Enhance ecological function by removing and managing reed canarygrass and yellow flag iris and replanting with native shrubs.

**Performance Standard 2B:** Areal cover of native shrubs in treatment area (shrub patches) at least 20% by Year 3. Visual estimates of plant cover within 5% of the treatment areas (shrub patches) and photographs of each patch sampled.

**Performance Standard 2G:** 25% of shrub patches will have an average diameter a minimum of 10% larger than baseline by Year 7.

**Objective 3:** Enhance ecological function by removing and managing English ivy from a 2.1-acre forested area.



**Performance Standard 3A:** Cutting of English ivy and root pulling with hand tools in treatment area. Documentation will include GPS map showing the perimeter of the treatment area and photographs of removal operations.

**Performance Standard 3B:** Areal coverage of English Ivy in treatment area reduced to below 40% by Year 3.

## **YEAR 3 (2014) MONITORING OF PHASE 1A AREAS ENHANCED IN 2011**

The areas where enhancement actions were completed in 2011 are shown on Figure 1 and summarized in Table 2. Work completed in 2011 included removal of reed canarygrass and yellow flag iris, planting of willow stakes, and the removal of English ivy.

### **Reed Canarygrass/Yellow Flag Iris Treatment and Willow Plantings**

Work completed during 2011 included 29.7 acres of reed canarygrass treatment and willow plantings. Willows were planted within 753 plots each measuring approximately 20 feet in diameter. The locations for the plots planted with willow stakes in 2011 were established in a grid pattern with 40-foot on center spacing using a Geographic Information System (GIS). The latitude and longitude of each of the plots was then loaded from the GIS into a mapping grade, hand-held global positioning system (GPS) unit with a horizontal accuracy of  $\pm 2$  feet (Trimble GeoXT). The GPS unit was used to locate the plot centers in the field (see Figure 2). Each plot was designated with a unique identifier (WP001 – WP753) for data tracking purposes and a wood lathe with the unique identifier written on it was used to mark the plot center. Survey flagging was attached to the wood lathe to help field locate the plot centers. Survey flagging was attached to the wood lathe to help field locate the plot centers.

Three species of willow stakes were planted: Pacific (*Salix lasiandra*), Sitka (*S. sitchensis*), and Hooker's (*S. hookeriana*). Stake spacing averaged 2 to 3 feet on center (approximately 57 stems per plot or 1,425 stems per acre).

A total of 42,000 willow stakes were planted within the 753 plots in 2011 over the March 23 through May 2, 2011 period. In some of the plots, the planting density was reduced due to unsuitable planting conditions (e.g., large woody debris, deep holes/excessive water depth) encountered in the field. Following the planting season, the GIS was used to draw a polygon around the planted plot locations, which had been located in the field using the GPS. Using this approach, the overall treatment area for 2011 was determined to be 29.7 acres. For comparison/validation purposes, at a planting density of approximately 1,425 stems per acre the 42,000 willow stakes would be enough to treat 29.5 acres. Similarly, at an average planting density of 25 plots per acre, the 753 plots equates to a treatment area of 30.12 acres.

Monitoring of the willow patches was conducted at 38 randomly selected plots covering 5% of the total number of plots. Plots selected for sampling are shown in red in Figure 2. Five photographs were taken at each sample plot during 2011, 2012, and 2014 to

document changes in shrub cover over time. One 2014 photograph from each of the sample plots is provided in Appendix A.

Monitoring results are to be compared with performance standards described in Table C.2 of the MBI.

#### **Aerial Shrub Cover within Willow Plots**

Performance standards for the willow planting plots include at least 20% areal coverage by native shrubs within planted plots in Year 3 (2014). At each of the 38 randomly selected plots, the cover provided by native willows was visually estimated. Two staff members made estimates of aerial cover and compared estimates. The average of the two estimates was recorded.

Results of the aerial coverage estimates are shown in Table 3. Shrub cover was estimated to average 37.7% with a standard error (SE) of 2.4 over the 38 plots monitored at the end of the Year 3 (2014) growing season. The average coverage provided by native shrubs over all 38 sample plots increased from 13.7% (SE 1.2) in Year 0 to 37.7% (SE 2.4) in Year 3. The 37.7% cover estimate exceeds the performance standard of 20% by Year 3 as described in the MBI.

**Table 3. Willow Aerial Coverage – 2011 Plantings (5% of total shrub plots)**

<b>Station Identifier</b>	<b>Shrub Cover (Baseline)</b>	<b>Shrub Cover Year 1 (%)</b>	<b>Shrub Cover Year 3 (%)</b>
WP014	10	5	52
WP058	10	2	30
WP075	30	Not Sampled	Not Sampled
WP115	10	5	30
WP191	10	10	70
WP199	10	5	40
WP220	10	5	50
WP243	10	5	40
WP294	35	5	25
WP305	30	2	45
WP342	10	5	30
WP388	10	7	40
WP402	10	2	10
WP405	15	2	20
WP410	10	5	36
WP417	10	2	25
WP428	10	2	40
WP435	10	2	31
WP440	10	2	30
WP465	10	2	15

Station Identifier	Shrub Cover (Baseline)	Shrub Cover Year 1 (%)	Shrub Cover Year 3 (%)
WP466	15	2	25
WP501	10	2	35
WP515	5	2	35
WP528	10	5	50
WP531	10	5	22
WP542	10	2	25
WP608	25	25	70
WP653	25	5	50
WP692	10	2	30
WP698	10	5	35
WP701	10	2	25
WP730	25	5	35
WP742	15	5	35
WP768	10	2	45
WP770	25	10	60
WP784	10	5	40
WP791	15	7	60
WP804	10	2	60
<b>Average</b>	<b>13.7</b>	<b>4.5</b>	<b>37.7</b>

### Diameter of Willow Plots

Performance standards for the willow planting plots also include an increase in the diameter of the plot in later years (Year 7 and Year 10). In order to provide a basis of comparison for the future diameter of the plots, the diameter of the plots was measured in the fall of the year the enhancement activity occurred (Year 0), during Year 1 (2012), and during Year 3 (2014). Three measurements of the plot diameter were made at each sample plot and averaged for each plot. Diameter measurements were taken near the end of the growing season using a fiberglass tape stretched through the center of the plot (marked with wood lath). Measurements were made from the outermost portion of the willow stems. The mean diameter for each individual plot during will be the baseline used to compare with the mean diameter that will be measured in Year 7 and Year 10.

Performance standards for Year 7 include a 10% minimum increase in plot diameter for at least 25% of the plots. Although performance standards for plot diameter are not required for Year 3, the diameters were measured to provide information on whether plot growth is on a positive trajectory toward achieving performance standards in later years. As summarized in Table 4 the average plot diameter has increased 4.2% at all plots from baseline to 2013. Thirteen of the 37 plots (35% of the plots) already meet or

exceed the Year 7 target diameter. That is, the Year 7 performance standard for the 2011 willows is already achieved for this enhancement area.

**Table 4. Willow Plot Diameters – Year 3 of 2011 Plantings (5% of total plots)**

Station Name	Mean Diameter in Year 0 (ft)	Mean Diameter in Year 3 (ft)	Year 3 (% Change)	Target Diameter (+10%) by Year 7 (ft)
WP014	20.4	21.5	5.7	22.4
WP058	21.2	22.5	6.3	23.3
WP075	21.7			23.9
WP115	21.4	19.1	-10.4	23.5
WP191	21.0	22.5	7.3	23.1
WP199	20.8	22.1	6.1	22.9
WP220	21.5	24.8	15.3	23.7
WP243	20.4	20.2	-1.2	22.5
WP294	20.1	19.0	-5.3	22.1
WP305	21.4	23.5	10.1	23.5
WP342	21.4	22.6	5.4	23.5
WP388	21.8	20.7	-5.1	24.0
WP402	21.3	19.2	-9.9	23.4
WP405	13.8	16.7	21.4	15.2
WP410	21.0	22.3	6.1	23.1
WP417	22.2	20.1	-9.4	24.4
WP428	21.7	20.6	-5.1	23.8
WP435	20.0	20.8	3.9	22.0
WP440	21.0	21.1	0.1	23.1
WP465	19.3	16.0	-17.2	21.3
WP466	19.5	26.1	33.8	21.4
WP501	19.0	21.1	11.1	20.9
WP515	19.0	16.9	-11.1	20.9
WP528	18.6	18.6	-0.2	20.5
WP531	17.6	20.3	15.5	19.4
WP542	20.7	19.6	-5.4	22.8

Station Name	Mean Diameter in Year 0 (ft)	Mean Diameter in Year 3 (ft)	Year 3 (% Change)	Target Diameter (+10%) by Year 7 (ft)
WP608	18.7	20.8	11.2	20.6
WP653	16.8	21.2	26.1	18.5
WP692	20.4	19.3	-5.2	22.4
WP698	20.7	20.9	1.1	22.7
WP701	21.0	16.7	-20.7	23.1
WP730	21.3	23.8	11.8	23.4
WP742	19.1	21.3	11.1	21.0
WP768	19.5	19.1	-2.0	21.5
WP770	18.5	20.8	12.5	20.4
WP784	20.1	20.4	1.3	22.1
WP791	22.0	24.8	12.8	24.2
WP804	20.2	25.7	27.3	22.2
Average	20.2	19.5	4.2	22.2

### **English Ivy Removal**

Pursuant to the MBI, sampling along transects and within sample plots will provide a measure of the area covered by English ivy. The cover estimates will be used to record progress toward meeting performance standards in later years (Years 3, 5, 7, and 10).

The perimeter of the English ivy infestation area was surveyed with a GPS unit during 2011 to aid with maintenance and monitoring. Randomly placed transects were set up and monitored in 2011 within the ivy infestation area to measure the baseline condition before treatment (Figure 3). Line intercept sampling was conducted along the transects and visual estimates of ivy cover were made within 10-foot diameter plots adjacent to the transects. Pre-treatment monitoring showed that average ivy cover was 30.4% (SE 8.9) in the sample plots and 42.7% (SE 28.7) along line intercept transects. A detailed summary of the ivy monitoring for each transect and plot is shown in Table 5.

Following the baseline monitoring, English ivy was removed from the 2.1-acre treatment area using hand tools. Aboveground material was cut and roots were grubbed out where possible. All material was removed from the site and disposed of at an offsite location.

As shown in Table 5, Performance Standard 3B was achieved by Year 3. However, additional ivy removal measures appear to be necessary if the areal coverage of English Ivy is to be reduced below 30% by Year 5 (Performance Standard 3C).

**Table 5. Ivy Monitoring Zones in Phase 1A/Nooksack Delta**

Sample Type	Baseline Percent Cover	Baseline Standard Error	Year 3 Percent Cover	Year 3 Standard Error
Ivy Sampling Plots	30.4	8.88	12.9	6.02
Ivy Sampling Transects	42.7	28.65	39.0	30.15

## **SUMMARY**

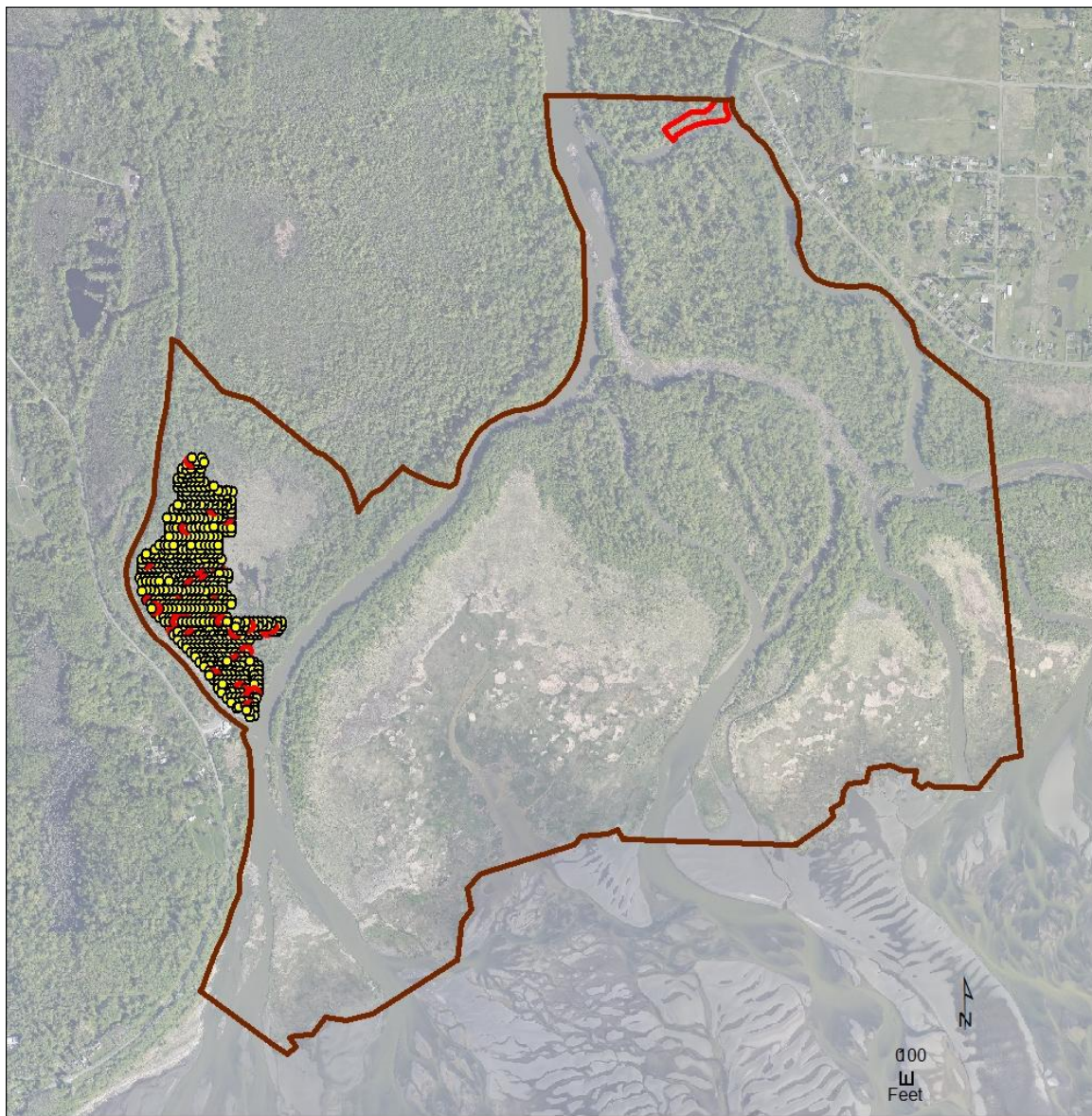
The enhancement actions taken in 2011 (willow plantings and ivy removal) were monitored during the fall 2014 to determine if performance standards for Year 3 were met. The results of monitoring show that the shrub planting plots achieved the 20% cover performance standard by Year 3. The average diameter of the willow plots increased an average of 4.2 percent over the baseline measurements and 35% of the sampled plots exceeded the baseline diameter by more than 10%, which exceeds the Performance Standard 2G for Year 7. Although the English Ivy treatment area also exceeded Performance Standard 3B in that areal cover of English Ivy is below 40% by Year 3, additional treatment will be required to meet the Year 5 and subsequent performance measures.

The results of enhancement actions and monitoring are being tracked using a custom-built database. An example of the summary information reported by the database is included in Appendix C.





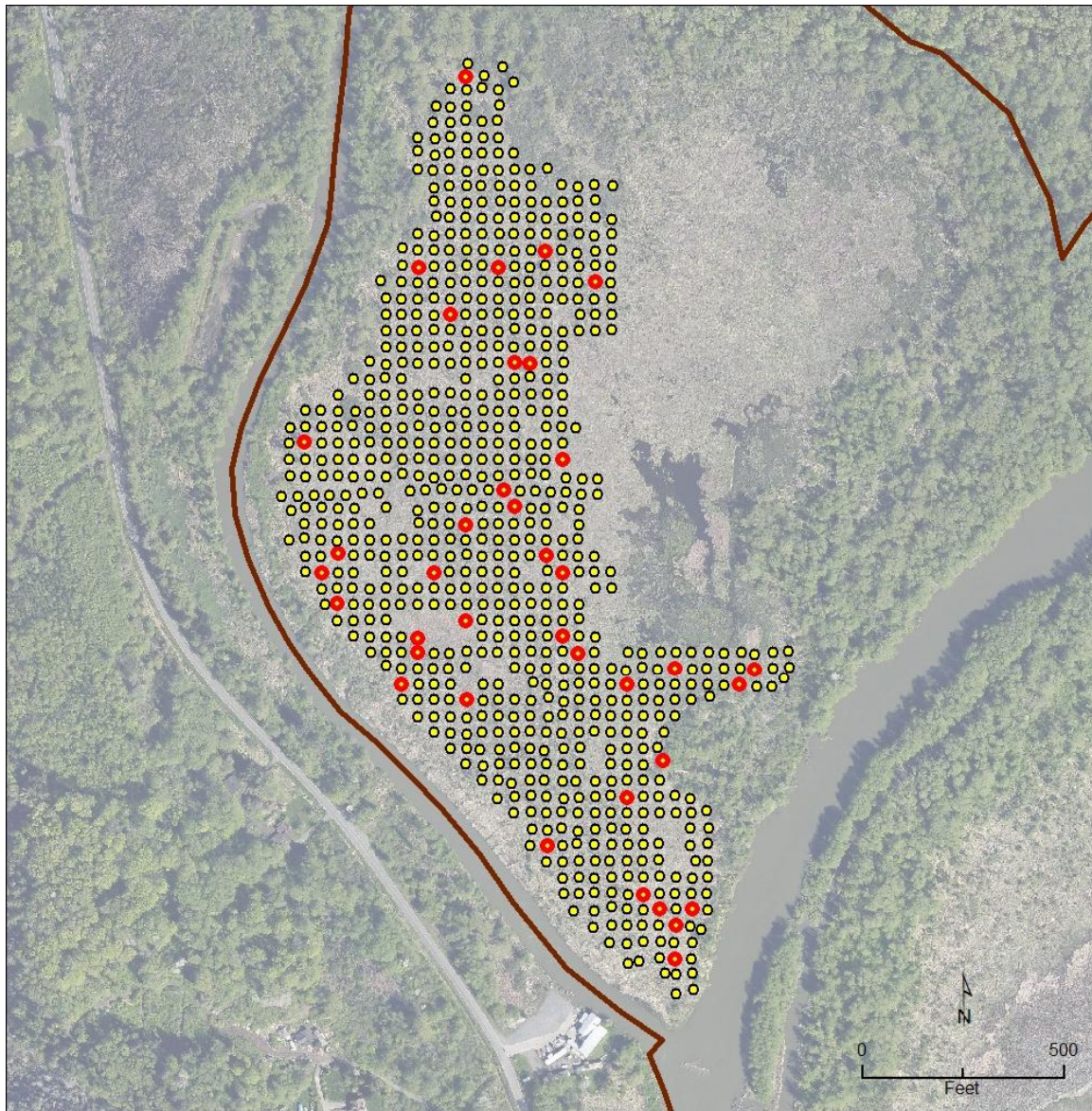
## FIGURES




- 20' dia. Willow Plot Locations**
- 2011 Monitoring Site
  - 2011 Plot
  - Ivy Removal/Monitoring Area
  - Mitigation Bank Boundary (Phase 1A)



**Figure 1. Phase 1A 2011 Enhancement Areas Monitored during 2014.**





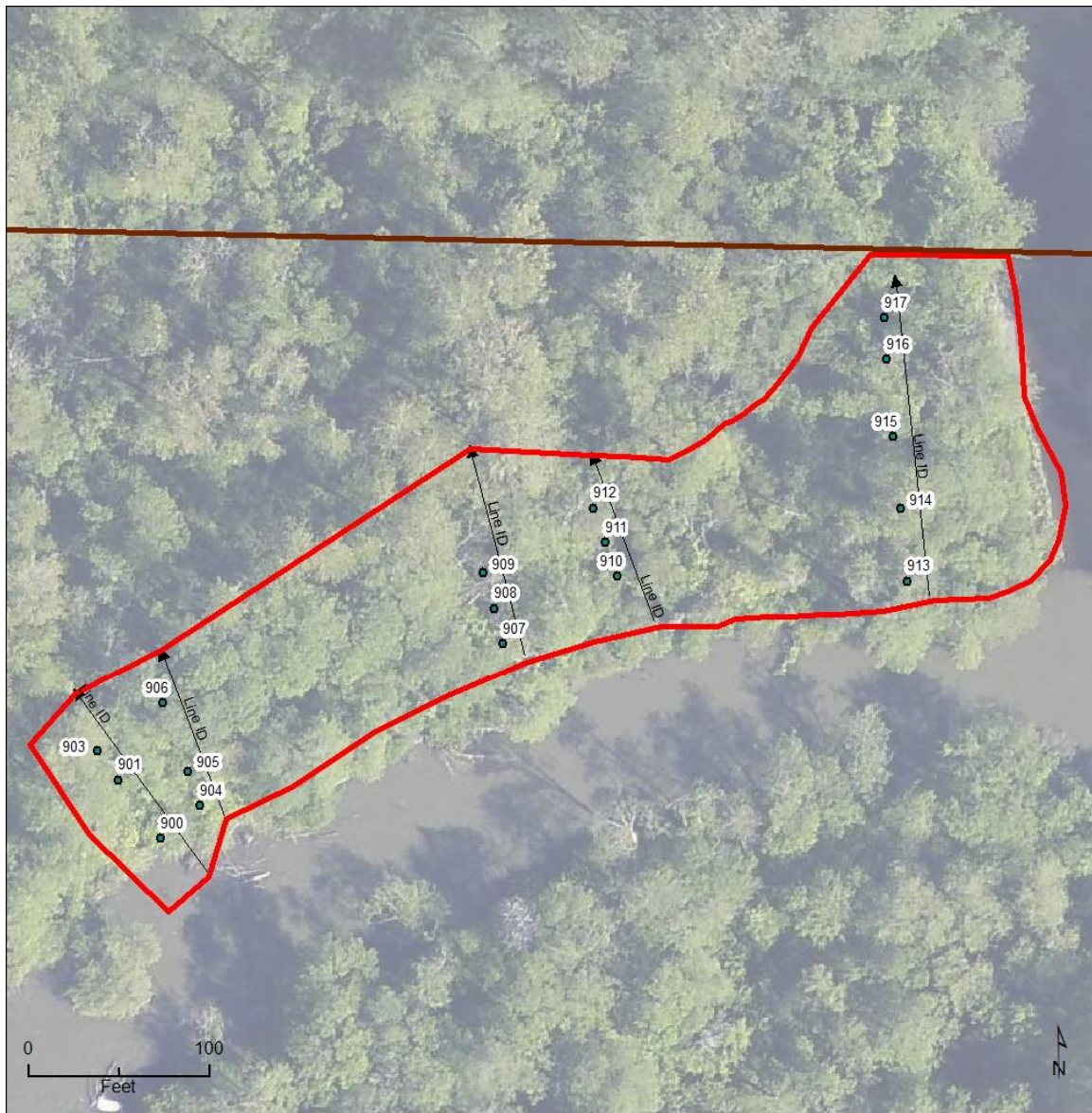
 Mitigation Bank Boundary (Phase 1A)

## 20' dia. Willow Plot Locations

-  2011 Monitoring Site
-  2011 Plot

**Figure 2. 2011 Reed Canarygrass/Yellow Flag Iris Treatment and Willow Plantings Monitored during 2014**





 Mitigation Bank Boundary (Phase 1A)

 Ivy Monitoring Area

• Ivy Monitoring Plot

—> Ivy Monitoring Transects




**Figure 3. 2011 English Ivy Removal Area, Monitoring Transect Locations and Monitored Plots during 2014**






## **APPENDIX A: Photographs of Willow Plots**




(End of Year 3)

(Photographs taken in September 2014 from south end of sample plots facing north and show willows planted during 2011.)




Station Identifier	Image
WP014	
WP058	
WP115	






Station Identifier	Image
WP191	 A photograph showing a dense stand of tall, green grasses. A blue ribbon is tied around one of the stems, serving as a marker. The background is a clear blue sky.
WP199	 A photograph showing a dense stand of tall, green grasses. A blue ribbon is tied around one of the stems, serving as a marker. The background is a clear blue sky.
WP220	 A photograph showing a dense stand of tall, green grasses. A blue ribbon is tied around one of the stems, serving as a marker. The background is a clear blue sky.




Station Identifier	Image
WP243	
WP294	
WP305	





Station Identifier	Image
WP342	 A photograph showing a person in a field of tall grass and shrubs. The person is wearing a dark shirt and is looking down at something in their hands. The field is filled with tall, green grass and several shrubs with large, green leaves. The background shows a clear blue sky.
WP388	 A close-up photograph of a person in a field of tall grass. The person is wearing a dark shirt and is looking down at something in their hands. The field is filled with tall, green grass and several shrubs with large, green leaves. The background shows a clear blue sky.
WP402	 A photograph showing a person in a field of tall grass and shrubs. The person is wearing a dark shirt and is looking down at something in their hands. The field is filled with tall, green grass and several shrubs with large, green leaves. The background shows a clear blue sky.








Station Identifier	Image
WP405	 A photograph showing a close-up of a wetland area. A vertical wooden post is visible on the left side. The vegetation consists of green, leafy plants with small, round fruits or seed pods. The background shows a field of tall, dry grasses under a bright sky.
WP410	 A photograph showing a wetland area with tall, green grasses and other vegetation. The plants are dense and appear to be growing in a wet, marshy environment. The background shows a field of tall, dry grasses under a bright sky.
WP417	 A photograph showing a wetland area with tall, green grasses and other vegetation. The plants are dense and appear to be growing in a wet, marshy environment. The background shows a field of tall, dry grasses under a bright sky.

Station Identifier	Image
WP428	
WP435	
WP440	



Station Identifier	Image
WP465	 A photograph showing a wetland area with tall green grass and a person in the background. The person is wearing a dark shirt and is standing in the grass. The foreground is filled with green grass and some taller plants.
WP466	 A photograph showing a wetland area with tall green grass and a person in the background. The person is wearing a white shirt and is standing in the grass. The foreground is filled with green grass and some taller plants.
WP501	 A photograph showing a wetland area with tall green grass and a person in the background. The person is wearing a dark shirt and is standing in the grass. The foreground is filled with green grass and some taller plants.




Station Identifier	Image
WP515	
WP528	
WP531	




Station Identifier	Image
WP542	
WP608	
WP653	




Station Identifier	Image
WP692	 A photograph showing a dense field of tall, green grasses. A blue survey flag is visible on the left side, partially obscured by the vegetation. The sky is clear and blue in the background.
WP698	 A photograph showing a wetland area with tall green grasses and some woody plants. A blue survey flag is visible on the left side, partially obscured by the vegetation. The sky is clear and blue in the background.
WP701	 A photograph showing a wetland area with tall green grasses and some woody plants. A blue survey flag is visible on the right side, partially obscured by the vegetation. The sky is clear and blue in the background.

Station Identifier	Image
WP730	
WP742	
WP768	



Station Identifier	Image
WP770	
WP784	
WP791	



Station Identifier	Image
WP804	



## **APPENDIX B: Photographs of Ivy Treatment Area**

(End of Year 3)



(Photographs taken on October 10, 2014 of Ivy Treatment Area Monitoring Plots)

Transect	Photo of Edge of Station
IP900	
IP901	
IP903	

IP904	
IP905	
IP906	
IP907	



IP908	
IP909	
IP910	
IP911	

IP912	
IP913	
IP914	
IP915	



<p>IP916</p>	
<p>IP917</p>	





## APPENDIX C: Monitoring Database Summary Report Form

### Lummi Nation Wetland and Habitat Mitigation Bank



#### Phase 1A Status Report

#### Nooksack Delta

##### Acres Planted/Treated in Phase 1A / Nooksack Delta

Making Willow Patches																			
2011:	2012:	2013:	2014:	2015:	2016:	2017:	2018:	2019:	2020:	2021:	2022:	2023:	2024:	2025:	2026:	2027:	2028:	2029:	2030:
29.7	29.9	0.8	5.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Underplanting with Conifers																			
2011:	2012:	2013:	2014:	2015:	2016:	2017:	2018:	2019:	2020:	2021:	2022:	2023:	2024:	2025:	2026:	2027:	2028:	2029:	2030:
0.0	50.5	17.0	24.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

##### Acres Monitored in Belt Transects in Phase 1A / Nooksack Delta

Total Acres Monitored in Belt Transects By Stage and Year						
	M0:	M1:	M3:	M5:	M7:	M10:
2012	0.796	0	0	0	0	0
2013	0.281	0.796	0	0	0	0
2014	0.329	0.281	0	0	0	0
	1.4	1.1	0	0	0	0

##### Conifer Heights Monitored in Belt Transects in Phase 1A / Nooksack Delta

Tree Height Statistics by Monitoring Stage			
Stage:	Mean Height (ft)	Std.Err.	Trees Measured:
Baseline	2.3	0.02	603
M1	2.1	0.03	357

##### Conifer Densities Monitored in Belt Transects

Conifer Densities (Trees per Acre) by Monitoring Stage			
Stage:	Mean ConiferDensity:	StdErr:	Transects:
Baseline	461.60	30.97	68
M1	320.80	25.95	62

##### Ivy Cover Monitored in Ivy Plots in Phase 1A / Nooksack Delta

Ivy Percent Cover in Plots by Monitoring Stage			
Stage:	Mean Cover (%)	Std.Err.	Plots Monitored:
Baseline	30.35	8.88	17
M1	10.82	5.46	17
M3	12.94	6.02	17

##### Ivy Cover Monitored in Ivy Line-Intercept Stations in Phase 1A / Nooksack Delta

Ivy Percent Cover in Line-Intercept Stations by Monitoring Stage			
Stage:	MeanCoverage (%)	Std.Err.	Lines Monitored:
Baseline	42.745	28.65	5
M1	35.558	31.871	5
M3	39.012	30.146	5

### Native Plant Cover Monitored in Shrub Patches in Phase 1A / Nooksack Delta

Native Plant Percent Cover in Plots by Monitoring Stage				
Stage:	MeanCoverage (%)	Std.Err.	Plots Monitored:	Precision:
Baseline	11.62	1.281	88	21.6
M1	5.55	0.527	73	18.6
M3	37.73	2.357	37	12.2

### Average Patch Diameters Monitored in Shrub Patches in Phase 1A / Nooksack Delta

Percentage of Patches Exceeding Original Diameter by 10%			
Stage:	% Exceeding	% Not Exceeding	Total Patches:
Baseline	0.0	100.0	88
M1	6.8	93.2	74
M3	35.1	64.9	37

### Individual Monitoring Zones in Phase 1A / Nooksack Delta

#### 2011 Ivy Management Zone

##### Ivy Percent Cover in Plots by Monitoring Stage

Stage:	MeanCoverage (%)	Std.Err.	Plots Monitored:
Baseline	30.4	8.88	17
M1	10.8	5.46	17
M3	12.9	6.02	17

##### Ivy Percent Cover in Line-Intercept Stations by Monitoring Stag

Stage:	MeanCoverage (%)	Std.Err.	Lines Monitored:
Baseline	42.7	28.65	5
M1	35.6	31.671	5
M3	39.0	30.146	5

#### 2011 Reed Can Grass Control Zone

##### Native Plant Percent Cover in Plots by Monitoring Stage

Stage:	MeanCoverage (%)	Std.Err.	Plots Monitored:
Baseline	13.7	1.173	38
M1	4.5	0.673	37
M3	37.7	2.357	37

##### Percentage of Patches Exceeding Original Diameter by 10

Stage:	% Exceeding	% Not Exceeding	Total Patches:
Baseline	0.0	100.0	38
M1	0.0	100.0	37
M3	35.1	64.9	37

#### 2012 Conifer Underplanting Zone

##### Total Acres Monitored in Belt Transects By Stage and Year

	M0:	M1:	M3:	M5:	M7:	M10:
2012	0.796	0	0	0	0	0
2013	0	0.796	0	0	0	0
	0.8	0.796	0	0	0	0

##### Tree Height Statistics by Monitoring Stage

Stage:	Mean Height (ft)	Std.Err.	Trees Measured:
Baseline	2.23	0.02	463
M1	2.02	0.04	300

##### Conifer Densities (Trees per Acre) by Monitoring Stage

Stage:	Mean ConiferDensity:	StdErr:	Transects:
Baseline	586.83	34.39	39
M1	384.45	31.07	39

#### 2012 Reed Can Grass Control Zone

##### Native Plant Percent Cover in Plots by Monitoring Stage

Stage:	MeanCoverage (%)	Std.Err.	Plots Monitored:
Baseline	5.4	1.524	35
M1	6.7	0.793	35

##### Percentage of Patches Exceeding Original Diameter by 10

Stage:	% Exceeding	% Not Exceeding	Total Patches:
Baseline	0.0	100.0	37
M1	13.9	86.1	36

#### 2013 Conifer Underplanting Zone

##### Total Acres Monitored in Belt Transects By Stage and Year

	M0:	M1:	M3:	M5:	M7:	M10:
2013	0.281	0	0	0	0	0
2014	0	0.281	0	0	0	0
	0.3	0.281	0	0	0	0

##### Tree Height Statistics by Monitoring Stage

Stage:	Mean Height (ft)	Std.Err.	Trees Measured:
Baseline	2.28	0.05	95
M1	2.25	0.08	57

##### Conifer Densities (Trees per Acre) by Monitoring Stage

Stage:	Mean ConiferDensity:	StdErr:	Transects:
Baseline	335.53	42.74	23
M1	212.79	36.91	23

#### 2013 Reed Can Grass Control Zone

##### Native Plant Percent Cover in Plots by Monitoring Stage

Stage:	MeanCoverage (%)	Std.Err.	Plots Monitored:
Baseline	3.0	0	1
M1	1.0	0	1

##### Percentage of Patches Exceeding Original Diameter by 10

Stage:	% Exceeding	% Not Exceeding	Total Patches:
Baseline	0.0	100.0	1
M1	0.0	100.0	1

#### 2014 Conifer Underplanting Zone

##### Total Acres Monitored in Belt Transects By Stage and Year

	M0:	M1:	M3:	M5:	M7:	M10:
2014	0.329	0	0	0	0	0
	0.3	0	0	0	0	0

##### Tree Height Statistics by Monitoring Stage

Stage:	Mean Height (ft)	Std.Err.	Trees Measured:
Baseline	2.35	0.08	45

##### Conifer Densities (Trees per Acre) by Monitoring Stage

Stage:	Mean ConiferDensity:	StdErr:	Transects:
Baseline	131.39	45.11	6

#### 2014 Reed Can Grass Control Zone

##### Native Plant Percent Cover in Plots by Monitoring Stage

Stage:	MeanCoverage (%)	Std.Err.	Plots Monitored:
Baseline	23.9	5.429	12

##### Percentage of Patches Exceeding Original Diameter by 10

Stage:	% Exceeding	% Not Exceeding	Total Patches:
Baseline	0.0	100.0	12